▼ BASICS OF PYTHON

```
print("Hello World")
```

```
        Hello World
```

▼ Variables

```
a = 5 # Numeric or integer␣
b = "We are learning python with Saeed" # String variable
c = 3j # Complex number
d = 23.5 # Float
print(a, type(a)) # type of Variable
print(b, type(b))
print(c, type(c))
print(d, type(d))
```

```
        5 <class 'int'>
        We are learning python with Saeed <class 'str'>
        3j <class 'complex'>
        23.5 <class 'float'>
```

▼ If you want to specify the data type of a variable, this can be done with casting

```
a = str(3)
b = int(3)
c = float(3)
print(a, type(a)) # type of Variable
print(b, type(b))
print(c, type(c))
```

```
        3 <class 'str'>
        3 <class 'int'>
        3.0 <class 'float'>
```

▼ Many Values to Multiple Variables

```
c, d, e = "Orange", "Banana", "Cherry"
print(c,d,e)
```

```
        Orange Banana Cherry
```

▼ One Value to Multiple Variables

```
f = g = h = "Orange"
print(f,g,h)
```

```
        Orange Orange Orange
```

▼ + operator

```
i, j , k = "Python ", 'is ','awesome '
print(i + j + k)
```

```
        Python is awesome
```

▼ Global Variables

```
x = "awesome"
def myfunc():
    print("Python is " + x)
myfunc()
```

```
Python is awesome
```

Strings

```
print('Fiza Abbasi')
```

```
Fiza Abbasi
```

Operators in Strings

```
a = "Fiza"
b = "Abbasi"
a + b , a*2
```

```
('FizaAbbasi', 'FizaFiza')
```

```
"a" in "fiza"
"b" in "fiza"
```

```
False
```

```
"b" not in "fiza"
"a" not in "fiza"
```

```
False
```

Built In Strings Functions

```
# ord()
ord("i")
```

```
105
```

```
# len()
a = "Fiza Abbasi"
len(i)
```

```
7
```

```
 # str()
str(3+23)
```

```
'26'
```

Strings Indexing

```
a = "Fiza Abbasi"
# positive indexing
a[0] , a[1], a[2], a[3], a[4], a[5]
```

```
('F', 'i', 'z', 'a', ' ', 'A')
```

```
# Negative indexing
a[-1] , a[-2], a[-3], a[-4], a[-5]
```

```
('i', 's', 'a', 'b', 'b')
```

```
a[0:5]
```

```
'Fiza '
```

```
# Specifying a Stride (step) in a String Slice
a[0:11:2]
```

```
       'Fz bai'
```

```
a[11:0:-2]
```

```
       'iab z'
```

▾ f Strings

```
 n = 20
m = 50
product = n * m
print(f"The product of {n} and {m} is {product}")
```

```
       The product of 20 and 50 is 1000
```

▾ Strings are Immutable

```
a.replace("F","M")
```

```
       'Miza'
```

▾ Strings Methods

```
a = "Fiza Abbasi"
```

```
a.upper() # Converts alphabetic characters to uppercase
```

```
       'FIZA ABBASI'
```

```
a.lower() # Converts alphabetic characters to lowercase
```

```
       'fiza abbasi'
```

```
a.swapcase()
```

```
       'fIZA aBBASI'
```

```
a.count("s") # Counts occurrences of a substring in the target string
```

```
       1
```

```
a.endswith
```

```
       <function str.endswith>
```

```
a.endswith("d",0,11)
```

```
       False
```

```
a.index("a")
```

```
       3
```

```
a.rfind("d")
```

```
       -1
```

```
a.isalnum()
```

```
       False
```

```
a.isalpha()
```

```
       False
```

```
a.isdigit()
```
        False

```
a.islower()
```
        False

▾ Strings Formatting

```
a.center(50, "-")
```
        '------------------Fiza Abbasi--------------------'

```
a.ljust(30, "*")
```
        'Fiza Abbasi******************'

```
'a\tb\tc'.expandtabs()
```
        'a   b   c'

```
a.rjust(30, "*")
```
        '******************Fiza Abbasi'

```
a.lstrip()
```
        'Fiza Abbasi'

```
a.zfill(20)
```
        '000000000Fiza Abbasi'

```
a.partition(" ")
```
        ('Fiza', ' ', 'Abbasi')

```
a.partition(" ")
```
        ('Fiza', ' ', 'Abbasi')

▾ Operators

Addition

```
print(2+3)
```
        5

▾ Subtraction

```
print(3-1)
```
        2

▾ Multiplication

```
print(3*2)
```

▾ Classic Division

```
print(6/2)
```

```
3.0
```

▼ Floor Division

```
print(6//2)
```

```
3
```

▼ Remainder

```
print(9%2)
```

```
1
```

▼ Power

```
print(8**3)
```

```
512
```

▼ Square Root

```
print(25**0.5)
```

```
5.0
```

▼ PEMDAS RULE

```
print(8**4+3-8*2/6)
```

```
4096.333333333333
```

▼ Input_variable

▼ Simple Input Function

```
fvt_fruit = input("What is Your Favourite Food?")
print(fvt_fruit)
```

```
What is Your Favourite Food?biryani
biryani
```

▼ Input Function at 2nd Stage

```
name=input("what is your name?")
age=int(input("how old are you?"))
greetings = "Hello"
print(f"{greetings} {name} You are {age} years old")
```

```
what is your name?Fiza Abbasi
how old are you?18
Hello Fiza Abbasi You are 18 years old
```

▼ Conditional_logic

1. Equal to ==
2. Not equal to !=
3. Less than <

4. Greater than >
5. Less than and equal to <=
6. Greater than and equal to >=

```
print(7==5)
print(6!=7)
print(1<2)
print(2<1)
print(5>=4)
print(3<=5)
```

```
        False
        True
        True
        False
        True
        True
```

```
maryam_age = 4
Min_age_at_school=5
print(maryam_age==Min_age_at_school)
```

```
        False
```

▾ IF_elif_else

```
score = float(input("Enter your score: "))
if score >= 90:
  grade = "A"
elif score >= 80:
    grade = "B"
elif score >= 70:
    grade = "C"
elif score >= 60:
    grade = "D"
else:
    grade = "F"
print("Your grade is:", grade)
```

```
        Enter your score: 90
        Your grade is: A
```

▾ Functions

```
def fun():
    name = "Fiza Abbasi"
    age =18
    Qualification = "BSC Transportation Engineering"
    City = "Lahore"
    Country ="Pakistan"
    print(name, age, Qualification, City, Country)
fun()
```

```
        Fiza Abbasi 18 BSC Transportation Engineering Lahore Pakistan
```

Double-click (or enter) to edit

▾ Parameters In Functions

```
def add_num(num1,num2,num3):
    print(num1 + num2 * num3)
add_num(10,14,6)
```

```
        94
```

▾ Return Keyword

```python
def     double(num):
    return num*2
double(5)
```

```
    10
```

Functions having default value

```python
def power(num, x=1):
    result = 1
    for i in range(x):
        result = result*num
    return result
power(2,3)
```

```
    8
```

Function with variable no of Arguments

```python
def multi_add(*args):
    result = 0
    for x in args:
        result = result + x
    return result
multi_add(1,2,3,4,5)
```

```
    15
```

Lambda Functions

```python
z = lambda x,y : x + y
z(2,3)
```

```
    5
```

Loop

For Loop

```python
for x in range(0,10,3): # Start:End:Step
    print(x)
```

```
    0
    3
    6
    9
```

For loop with Break Statement

```python
days = ["Mon","Tue","Wed","Thu","Fri","sat","sun"]
for i in days:
    if (i=="Fri"):
        break
print(i)
```

```
    Fri
```

For loop with continue statement

```
days = ["Mon","Tue","Wed","Thu","Fri","sat","sun"]
for i in days:
    if (i=="Fri"): # Fri will not print
        continue
print(i)
```

```
    sun
```

While Loop

```
x=1 #           starting point
while (x<10):
    print(x)
    x=x+3 # increament
```

```
    1
    4
    7
```

Tuples

Constructing Tuple

```
t1 = (2,"Fiza Abbasi",3.5, False)
t2 = (20,30,40,50,60,70,80)
```

```
# length of tuple
len(t1)
```

```
    4
```

```
# Indexing of Tuple
t1[1],t1[2]
```

```
    ('Fiza Abbasi', 3.5)
```

```
# Slicing
t1[1:2]
```

```
    ('Fiza Abbasi',)
```

```
# Min and Max
min(t2)
max(t2)
```

```
    80
```

Tuple Methods

```
t1.count(3.5)
```

```
    1
```

```
t1.index("Fiza Abbasi")
```

```
    1
```

Lists

```
list1=[2,"abbasi","codanics",479,53.2,False]
list2=[3,5,"fiza","ashare",True]
```

```
print(type(list1))
print(len(list2))
```

```
    <class 'list'>
    5
```

```
list3=[20,30,50,67,76,38,2345,343,345643,234534,45]
```

```
list3.sort()
print(list3)
```

```
    [20, 30, 38, 45, 50, 67, 76, 343, 2345, 234534, 345643]
```

```
list3.reverse()
print(list3)
```

```
    [345643, 234534, 2345, 343, 76, 67, 50, 45, 38, 30, 20]
```

▾ Dictionaries

```
my_dict = {'Laraib': 20, 'Ayesha': 19, 'Areeba': 15}
```

▾ Accessing Value

```
my_dict['Laraib']
```

```
    20
```

▾ Modifying a Dictionary

```
my_dict = {'apple': 2, 'banana': 3, 'cherry': 5}
my_dict['apple'] = 4
print(my_dict)
```

```
    {'apple': 4, 'banana': 3, 'cherry': 5}
```

▾ Ilterating in Dictionaries

```
my_dict = {'name': 'Bisma', 'age': 22, 'country': 'USA'}
# iterate over the keys
for key in my_dict:
    print(key)
# iterate over the values
for value in my_dict.values():
    print(value)
# iterate over the key-value pairs
for item in my_dict.items():
    print(item)
```

```
    name
    age
    country
    Bisma
    22
    USA
    ('name', 'Bisma')
    ('age', 22)
    ('country', 'USA')
```

▾ Sets

```
s1 = {1,2,3,4,5,6,7,8,9,10}
s2 = {1,2,3,4,5,6,7,8,9,10,11,12,13,14,15}
```

```
# Union of two sets
print(s1.union(s2))
```

```
    {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}
```

```python
# Intersection of two sets
print(s1.intersection(s2))
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
```

```python
# Set difference
print(s2.difference(s1))
```

```
{11, 12, 13, 14, 15}
```

```python
# Symmetric difference
print(s1.symmetric_difference(s2))
```

```
{11, 12, 13, 14, 15}
```

```python
# Subset
print(s1.issubset(s2))
```

```
True
```

```python
# Superset
print(s2.issuperset(s1))
```

```
True
```

```python
# Disjoint
print(s1.isdisjoint(s2))
```

```
False
```

▾ Sequence_Functions

▾ Enumerate

```python
a = ["Apple", "Orange","Banana"]
b = enumerate(a)
print(list(b))
```

```
[(0, 'Apple'), (1, 'Orange'), (2, 'Banana')]
```

▾ Sorted

```python
sorted([7, 1, 2, 6, 0, 3, 2])
```

```
[0, 1, 2, 2, 3, 6, 7]
```

▾ Zip

```python
list1 = ["Apple","Banana","Orange"]
list2 = ["Bisma","Fiza","Amna"]
ziplist = zip(list1,list2)
print(list(ziplist))
```

```
[('Apple', 'Bisma'), ('Banana', 'Fiza'), ('Orange', 'Amna')]
```

▾ Reversed

```python
list(reversed(range(10)))
```

```
[9, 8, 7, 6, 5, 4, 3, 2, 1, 0]
```

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